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DIFFUSER WITH CONICAL AND STEPPED CHANNEL EXPANSION FOR REDUCING GAS FLOW VELOCITY

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DIFFUSER WITH CONICAL AND STEPPED CHANNEL EXPANSION FOR REDUCING GAS FLOW VELOCITY

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ABSTRACT. A patent has been issued for a diffuser with a conical and stepped channel expansion designed to reduce gas flow velocity. The diffuser contains a grid in the section behind the stepped channel expansion. The grid is the same size as the diffuser opening before the stepped channel expansion, in order to improve the uniformity of the exit velocity field at high subsonic inlet velocities in the diffuser, and the hydraulic drag coefficient of the grid is eight.

This suggestion relates to equipment for wind tunnels, where diffusers of /1[1] various types are used to decrease gas flow velocity in channels. The diffusers are made in the form of channel sectors which allow gradual or stepped expansion of the channel area.

Known short stepped diffusers with grids across the entire cross section beyond the step have considerably greater hydraulic resistance and considerably poorer velocity fields than ordinary, long diffusers.

The diffuser here suggested differs in that the grid has the same size as the aperture in the diffuser before the stepped expansion, and the hydraulic drag coefficient of the grid $\xi \approx 8$.

This allows the evenness of the velocity field at the output to be improved at high subsonic velocities at the input to the diffuser.

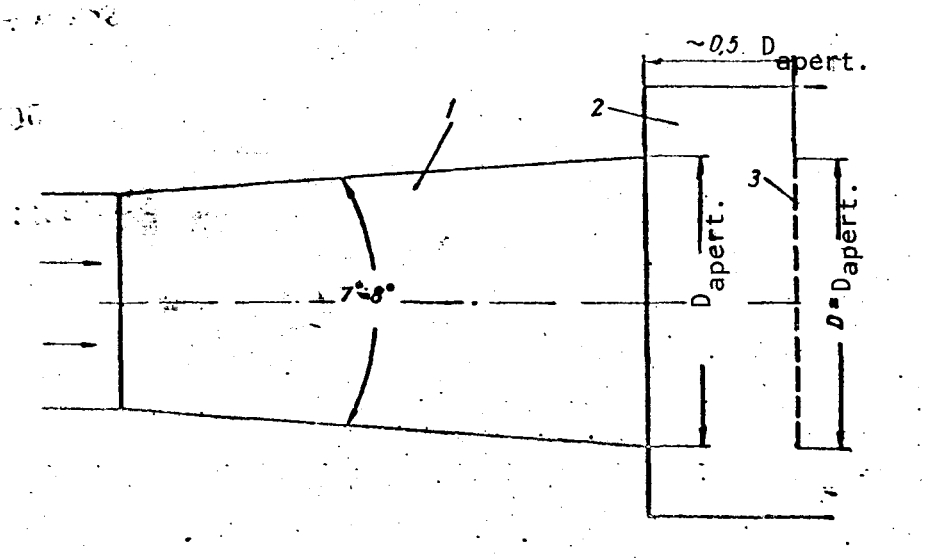
The drawing shows the suggested diffuser.

It has conical sector (1) with aperture angle 7-8°, ending in the stepped channel expansion (2). In the broad sector of the channel, at a distance of approximately one radius of the channel aperture in the cross section before the stepped expansion, grid (3) is installed. The size (diameter) of this grid corresponds to the diameter of the aperture. The optimal permeability coefficient of the grid is 40%. This corresponds to a hydraulic drag coefficient of the grid $\xi \approx 8$.

[1] Numbers in the Margin indicate pagination in the foreign text.

Patent Claims

A diffuser designed for reduction of gas flow velocities with conical and stepped channel expansion, containing a grid in the section beyond the stepped channel expansion, differing in that, in order to improve homogeneity of the velocity field at the output at high subsonic velocities at the input to the diffuser, the grid is made to a diameter equal to the diameter of the diffuser aperture before the stepped expansion, and the hydraulic drag coefficient of the lattice $\xi \approx 8$.



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